AMENDMENTS TO THE CLAIMS

1. (**Previously Presented**) A method of making an antibody molecule, the antibody containing an immunoglobulin heavy chain comprising a α3 domain or a mu domain, the method comprising:

(a) Providing a nucleotide sequence encoding an immunoglobulin heavy chain molecule;

(b) Modifying the nucleotide sequence to form a modified nucleotide sequence, wherein the modifying is in the region of the nucleotide sequence encoding the C-terminus 18 amino acids of the immunoglobulin heavy chain molecule to remove, or reduce the effectiveness of, one or more vacuolar targeting signal of the encoded immunoglobulin heavy chain;

(c) Inserting the modified nucleotide sequence into a host cell; and

(d) Causing the host cell to express the modified nucleotide sequence to form a modified immunoglobulin heavy chain and secrete the modified immunoglobulin heavy chain from the host cell.

2-33. **(Cancelled)**

34. (**Previously Presented**) A method according to claim 1 wherein the immunoglobulin heavy chain molecule is IgA, IgM or an IgA/G hybrid.

35. (**Previously Presented**) A method according to claim 1 wherein the nucleotide sequence is modified by at least one of the modifications selected from the group consisting of

(i) one or more point mutations of the nucleotide sequence,

(ii) deleting one or more nucleotides,

(iii) adding one or more nucleotides and

(iv) replacing one or more nucleotides with a synthetic nucleotide sequence.

36. (**Previously presented**) A method according to claim 35, wherein the synthetic nucleotide sequence encodes an amino acid sequence of general formula:

$-(Xaa_1)_m\ C(Xaa_2)_n$

where: C = a cysteine residue

Xaa_1 = independently any amino acid with the proviso that it is not from I, L or forms a consecutive sequence $X_1\ X_2\ X_3$ V S X_4 (SEQ ID NO: 1)

where: X_1 = N, H or L

X_2 = V or Y

X_3 = S or N

X_4 = aliphatic amino acid

Xaa_2 = independently any amino acid

m = at least 2

n = 0 to 5.

37. (**Previously presented**) A method according to claim 36, wherein Xaa_2 is Y and n = 1.

38. (**Previously Presented**) A method according claim 1, wherein nucleotides encoding the last 16 amino acids of the immunoglobulin heavy chain are deleted.

39. (**Previously Presented**) A method according to claim 1 wherein the resultant amino acid sequence at the C terminus of the immunoglobulin heavy chain has a formula selected from the group consisting of:

(a) SCMVGHEALPMNFTQKTIDRLSGKPACY (SEQ ID NO: 7),

(b) SCMVGHEALPMNFTQKTIDRLSGKPAAACY (SEQ ID NO: 8),

(c) SCMVGHEALPMNFTQKTIDRLSGKPHASTPEPDPVACY (SEQ ID NO: 9) and

(d) SCMVGHEALPMNFTQKTIDRLSGKPAAAAACY (SEQ ID NO: 69).

40. (**Previously Presented**) A method according to claim 1 wherein the nucleotide sequence of part (a) originally encoded the amino acid sequence:

X_1 X_2 X_3 V S X_4 (SEQ ID NO: 1)
where: X_1 = N, H or L
X_2 = V or Y
X_3 = S or N
X_4 = aliphatic amino acid.

41. (**Previously presented**) A method according to claim 40, wherein the amino acid sequence is: N V S V S V (SEQ ID NO: 2).

42. (**Previously Presented**) A method according to claim 1 wherein the nucleotide sequence of part (a) encoded L or I.

43. (**Previously Presented**) A method according to claim 42, wherein the modified nucleotide sequence encodes a modified amino acid selected from the group consisting of:

(i) an isoleucine 3 amino acids from the C-terminus end of the immunoglobulin heavy chain,

(ii) an isoleucine 10 amino acids from the C-terminus end of the immunoglobulin heavy chain and

(iii) an isoleucine 3 amino acids from the C-terminus end of the immunoglobulin heavy chain and an isoleucine 2 amino acids from the C-terminus end of the immunoglobulin heavy chain.

44. (**Previously Presented**) A method according to claim 1, wherein the modified nucleotide sequence is contained within a nucleotide sequence encoding the sequence:

P T X_1 X_2 X_3 V S X_4 X_5 X_6 X_7 X_8 X_9 X_{10} X_{11} X_{12} C X_{13} (SEQ ID NO: 5)
where: X_1 = N, H or L
X_2 = V or Y
X_3 = S or N
X_4 = an aliphatic amino acid
X_5 = an aliphatic amino acid
X_6 = M, V or L
X_7 = S or A
X_8 = E or D

X_9 = any amino acid
X_{10} = D, E, G or A
X_{11} = G or S
X_{12} = I, T, V, Z or A
X_{13} = may or may not be present and, where present is A or Y.

45. (**Previously Presented**) A method of adding J-chain binding capability to the immunoglobulin heavy chain of an antibody comprising the steps of:

(a) providing a nucleotide encoding an immunoglobulin heavy chain;

(b) adding to that nucleotide a nucleotide sequence encoding a synthetic tail with the amino acid sequence:

$-(Xaa_1)_m\ C(Xaa_2)_n$

where: C = Cys

Xaa_1 is independently any amino acid with the proviso that it is not I or L or forms a consecutive sequence $X_1\ X_2\ X_3$ V S X_4 (SEQ ID NO: 1) (where X_1 = N, H or L; X_2 = V or Y; X_3 = S or N; X_4 = aliphatic amino acid)

Xaa_2 = independently any amino acid

m = at least 2

n = 0 to 5; and

(c) expressing the immunoglobulin nucleotide in a host cell to form an immunoglobulin heavy chain capable of binding J-chain.

46. (**Previously presented**) A method according to claim 1 wherein the host cell is a plant cell.

47. (**Previously presented**) A method according to claim 45 wherein the host cell is a plant cell.

48. (**Previously presented**) A method according to claim 46, wherein the plant cell is part of a transgenic plant.

49. (**Previously presented**) A method according to claim 47, wherein the plant cell is part of a transgenic plant.

50. (**Previously presented**) A method according to claim 1 additionally comprising the step of isolating and purifying the antibody molecule.

51. (**Previously presented**) A method according to claim 45 additionally comprising the step of isolating and purifying the antibody molecule.

52. (**Previously Presented**) A method according to claim 50, wherein the antibody molecule is subjected to a protease digest to produce Fab or $F(ab')_2$ fragments.

53. (**Previously presented**) A method according to claim 51, wherein the antibody is subjected to a protease digest to for Fab or $F(ab')_2$ fragments.

54. (**Previously Presented**) An antibody containing an immunoglobulin heavy chain comprising an α3 domain or a mu domain, the α3 domain or mu domain lacking one or more targeting signals towards the C-terminal end.

55. (**Previously presented**) An antibody capable of binding J-chain comprising at its C-terminal end the sequence:

$-(Xaa_1)_m\ C(Xaa_2)_n$

where: C = Cys

Xaa_1 is independently any amino acid with the proviso that it is not I or L or forms a consecutive sequence $X_1\ X_2\ X_3$ V S X_4 (SEQ ID NO: 1) (where X_1 = N, or L; X_2 = V or Y; X_3 = S or N; X_4 = aliphatic amino acid)

Xaa_2 = independently any amino acid

m = at least 2

n = 0 to 5

56. (**Previously presented**) An antibody according to claim 54 which does not contain the targeting signal: $X_1\ X_2\ X_3$ V S X_4 (SEQ ID NO: 1)

where: X_1 = N, H or L
X_2 = V or Y
X_3 = S or N
X_4 = aliphatic amino acid.

57. (**Previously presented**) An antibody according to claim 55 which does not contain the targeting signal: $X_1\ X_2\ X_3$ V S X_4 (SEQ ID NO: 1)

where: X_1 = N, H or L
X_2 = V or Y
X_3 = S or N
X_4 = aliphatic amino acid.

58. (**Previously presented**) An antibody according to claim 56, wherein the targeting signal is N V S V S V (SEQ ID NO: 2).

59. (**Previously presented**) An antibody according to claim 57, wherein the targeting signal is N V S V S V (SEQ ID NO: 2).

60. (**Previously presented**) An antibody according to claim 54 which contains one or no isoleucine or leucine amino acids within the last 18 amino acids at the C-terminus of the heavy chain of the antibody.

61. (**Previously presented**) An antibody according to claim 55 which contains one or no isoleucine or leucine amino acids within the last 18 amino acids at the C-terminus of the heavy chain of the antibody.

62. (**Previously presented**) An antibody according to claim 54 comprising at the C-terminus end of the heavy chain of antibody, the sequence:

$-(Xaa_1)_m\ C(Xaa_2)_n$

where: C = cysteine residue
Xaa_1 = independently any amino acid with the proviso that it is not I or L or forms a consecutive sequence $X_1\ X_2\ X_3$ V S X_4 (SEQ ID NO: 2)
where: X_1 = N, H or L

X_2 = V or Y
X_3 = S or N
X_4 = aliphatic amino acid

Xaa_2 = independently any amino acid
m = at least 2
n = 0 to 5.

63. (**Previously presented**) An antibody according to claim 55 comprising at the C-terminus end of the heavy chain of antibody, the sequence:

$-(Xaa_1)_m\ C(Xaa_2)_n$

where: C = cysteine residue
Xaa_1 = independently any amino acid with the proviso that it is not I or L or forms a consecutive sequence $X_1\ X_2\ X_3$ V S X_4 (SEQ ID NO: 2)
where: X_1 = N, H or L
X_2 = V or Y
X_3 = S or N
X_4 = aliphatic amino acid

Xaa_2 = independently any amino acid
m = at least 2
n = 0 to 5.

64. (**Previously presented**) An antibody according to claim 54 in which at least two, preferably two to four, glycine or alanine residues are present downstream of a C-terminal targeting sequence

65. (**Previously presented**) An antibody according to claim 55 in which at least two, preferably two to four, glycine or alanine residues are present downstream of a C-terminal targeting sequence

66. (**Previously presented**) An antibody according to claim 54 in which at least the terminal amino acid residue of a C-terminal targeting sequence is replaced by at least two, preferably two to four, glycine or alanine residues.

67. (**Previously presented**) An antibody according to claim 55 in which at least the terminal amino acid residue of a C-terminal targeting sequence is replaced by at least two, preferably two to four, glycine or alanine residues.

68. (**Previously presented**) A method of treating a disease by administering an antibody according to claim 54 to a patient.

69. (**Previously presented**) A method of treating a disease by administering an antibody according to claim 55 to a patient.

70. (**Previously presented**) A method of prophylaxis, comprising administering an antibody according to claim 54 to a person or animal.

71. (**Previously presented**) A method of prophylaxis, comprising administering an antibody according to claim 55 to a person or animal.

72. (**Previously presented**) A vector comprising a nucleotide sequence encoding an antibody according to claim 54.

73. (**Previously presented**) A vector comprising a nucleotide sequence encoding an antibody according to claim 55.

74. (**Previously presented**) A host cell comprising a nucleotide sequence encoding antibody according to claim 54.

75. (**Previously presented**) A host cell comprising a nucleotide sequence encoding antibody according to claim 55.

76. (**Previously presented**) A host cell comprising a vector according to claim 72.

77. (**Previously presented**) A host cell comprising a vector according to claim 73.

78. (**Previously presented**) A transgenic plant comprising a nucleotide encoding an antibody according to claim 54.

79. (**Previously presented**) A transgenic plant comprising a nucleotide encoding an antibody according claim 55.

80. (**Previously presented**) An immunoassay comprising an antibody as defined in claim 54.

81. (**Previously presented**) An immunoassay comprising an antibody as defined in claim 55.

82. (**Previously Presented**) The method of claim 1, further comprising adding to the nucleotide sequence encoding the immunoglobulin heavy chain a nucleotide sequence encoding a synthetic tail with the amino acid sequence $-(Xaa_1)_m\ C(Xaa_2)_n$, wherein:

- - C = Cys
- Xaa_1 is independently any amino acid with the proviso that it is not I or L or forms a consecutive sequence $X_1\ X_2\ X_3$ V S X_4 (where X_1 = N, H or L; X_2 = V or Y; X_3 = S or N; X_4 = aliphatic amino acid)
- $-Xaa_2$ = independently any amino acid
- -m = at least 2
- -n = 0 to 5; and

wherein said synthetic tail adds J-chain binding capability to the heavy chain of the immunoglobulin.

83. (**Previously presented**) A method according to claim 82 wherein the host cell is a plant cell.

84. (**Previously presented**) A method according to claim 83, wherein the plant cell is part of a transgenic plant.

85. (**Previously presented**) A method according to claim 82 additionally comprising the step of isolating and purifying the antibody molecule.

86. (**Previously Presented**) A method according to claim 85, wherein the antibody molecule is subjected to a protease digest to produce Fab or $F(ab')_2$ fragments.

87. **(Previously Presented)** The method according to claim 44, wherein at least one of X_1-X_{13} is a member selected from the group consisting of:

$X_1 = N$

$X_2 = V$

$X_4 = V$ or L

$X_5 = I$, V or L

$X_6 = M$

$X_9 = G$, V, A or T

$X_{10} = D$

$X_{11} = G$

$X_{12} = I$ or T.

88. (NEW) A method of making an antibody molecule, the antibody containing an immunoglobulin heavy chain comprising a α3 domain or a mu domain, the method comprising:

(a) Providing a nucleotide sequence encoding an immunoglobulin heavy chain molecule;

(b) Modifying the nucleotide sequence to form a modified nucleotide sequence of (a) by deleting the last 16 amino acids of the immunoglobulin heavy chain molecule .

(c) Inserting the modified nucleotide sequence into a host cell; and

(d) Causing the host cell to express the modified nucleotide sequence to form a modified

immunoglobulin heavy chain and secrete the modified immunoglobulin heavy chain from the host cell.

89. (**NEW**) A method according to claim 88 wherein the immunoglobulin heavy chain molecule is IgA, IgM or an IgA/G hybrid.